SAF-RC-048 100 Area and 300 Area Component of the RCBRA Water Sampling FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Jill Thomson

H0-23

NB 5/22/06 INITIAL/DATE

Jeanette Duncan

H9-02

NB 5/22/06 initial/date

COMMENTS:

SDG k

K0277

SAF-RC-048

Rad only

X Chem only

Rad & Chem

X Complete

Partial

Waste Site: Water Equipment Blank



EDMC



Joan Kessner WC-Hanford 3190 Washington Way MSIN H9-03 Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:



Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLl Batch #	0603L617
SDG#	K0277
SAF#	RC-048
Date Received	3/28/06
# Samples	1
Mat\rix	WATER
Volatiles	
Semivolatiles	
Pest/PCB	Χ
PAH	
DRO/KRO/GRO	
GC Alcohols	
Herbicides	
Metals	Х
Inorganics	

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory Incorporated

Orlette S. Johnson Project Manager

r:\group\pm\orlette\tnu-hanford\data\b_ltrs.doc



Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0277

DATE RECEIVED:	03/28/06	LVL LOT # :0603L617

CLIENT ID /ANALYSIS	LVL #	MTX 	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J11234						
SILVER, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
ALUMINUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
ARSENIC, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
BORON, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
BARIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
BERYLLIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
BISMUTH, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
CALCIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
CADMIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
COBALT, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
CHROMIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
COPPER, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
IRON, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
MERCURY, TOTAL	001	W	06C0057	03/23/06	03/29/06	03/30/06
POTASSIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
LITHIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
MAGNESIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
MANGANESE, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
MOLYBDENUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
SODIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
NICKEL, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
PHOSPHORUS, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
LEAD, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
ANTIMONY, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
SELENIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
SILICON, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
TIN, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
STRONTIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
THALLIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
URANIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
VANADIUM, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06
ZINC, TOTAL	001	W	06L0195	03/23/06	03/30/06	04/03/06

LAB QC:

SILVER LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
011111111111111111111111111111111111111				•		

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0277

DATE RECEIVED: 03/28/06 LVL LOT # :0603L617

CLIENT ID /ANALYSIS	LVL	#	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SILVER, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
ALUMINUM LABORTORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
ALUMINUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
ARSENIC LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
ARSENIC, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
BORON LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
BORON, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
BARIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
BARIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
BERYLLIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
BERYLLIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
BISMUTH, LCS	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
BISMUTH, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
CALCIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
CALCIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
CADMIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
CADMIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
COBALT LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
COBALT, TOTAL	MB1	i	W	06L0195	N/A	03/30/06	04/03/06
CHROMIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
CHROMIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
COPPER LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
COPPER, TOTAL	MB1		M	06L0195	N/A	03/30/06	04/03/06
IRON LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
IRON, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
MERCURY LABORATORY	LC1	BS	W	06C0057	N/A	03/29/06	03/30/06
MERCURY, TOTAL	MB1		W	06C0057	N/A	03/29/06	03/30/06
MERCURY, TCLP LEACHA	MB2		W	06C0057	N/A	03/29/06	03/30/06
POTASSIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
POTASSIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
LITHIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
LITHIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
MAGNESIUM LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
MAGNESIUM, TOTAL	MB1		W	06L0195	N/A	03/30/06	04/03/06
MANGANESE LABORATORY	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
MANGANESE, TOTAL	MBl		W	06L0195	N/A	03/30/06	04/03/06
MOLYBDENUM LABORATOR	LC1	BS	W	06L0195	N/A	03/30/06	04/03/06
MOLYBDENUM, TOTAL	MBl		W	06L0195	N/A	03/30/06	04/03/06

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0277

DATE RECEIVED: 03/28/06 LVL LOT # :0603L617

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SODIUM LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
SODIUM, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
NICKEL LABORATORY	LC1 BS	M	06L0195	N/A	03/30/06	04/03/06
NICKEL, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
PHOSPHORUS LCS	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
PHOSPHORUS, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
LEAD LABORATORY	LC1 BS	W	0.6L0195	N/A	03/30/06	04/03/06
LEAD, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
ANTIMONY LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
ANTIMONY, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
SELENIUM LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
SELENIUM, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
SILICON LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
SILICON, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
TIN LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
TIN, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
STRONTIUM LCS STANDA	LC1 BS	M	06L0195	N/A	03/30/06	04/03/06
STRONTIUM, TOTAL	MB1	M	06L0195	N/A	03/30/06	04/03/06
THALLIUM LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
THALLIUM, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
URANIUM LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
URANIUM, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
VANADIUM LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
VANADIUM, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06
ZINC LABORATORY	LC1 BS	W	06L0195	N/A	03/30/06	04/03/06
ZINC, TOTAL	MB1	W	06L0195	N/A	03/30/06	04/03/06



Analytical Report

Client: TNU-HANFORD RC-048

LVL#: 0603L617

SDG/SAF#: K0277/RC0-048

W.O.#: 11343-606-001-9999-00

Date Received: 03-28-06

METALS CASE NARRATIVE

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvLI) certifies that all test results meet the requirements of NELAC except as noted below.

- 1. This narrative covers the analysis of 1 water sample.
- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample was reported from a different instrument for Aluminum, Beryllium, Calcium, Iron, Magnesium, Manganese, Potassium, Phosphorous, and Sodium due to sample matrix.
- 3. All analyses were performed within the required holding times.
- 4. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
- 5. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 6. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 7. All ICP Interference Check Standards were within control limits.
- 8. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 9. All matrix spike (MS) and duplicate analyses were performed on TNU-HANFORD RC-048, LvLi# 0603L754 due to limited sample volume in this batch.
- For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

region of less-certain quantification.

- 11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 12. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

jjw/m03-617

5/12/06



METALS METHOD GLOSSARY

The following meth Lot#: ()(0031_6	nods are used as refe	rence for the digestio	n and analysis }	of samples c	ontained within th
Leaching Procedur	e:13101311	1312Other:		1	
•	estion andAnalysi		3.0 _ILM04.	0 .	
-i Di	lethods: \(\sum_3005A\)	3010A 3015 30	20A _3050B	30512	200.7SS17
Metals Digestion M	Other:		_		
	_ _	letals Analysis Me	ethods		
· -	. 14	Tetulo implicações sur	,	EPA	
	SW846	EPA	STD MTD	OSWR	USATHAMA
	%6010B	200.7			99
Aluminum	✓6010B 7041°	200.7 204.2			99
Antimony	★6010B 7060A		3113B		99
Arsenic	₹6010B	200.7	•		99
Barium	×6010B	200.7			99
Beryllium	76010B'	200.7 1		1620	99
Bismuth	√ 6010B	200.7			99
Boron	₹6010B 7131A	·200.7213.2			99
Cadmium Calcium	₹6010B	20 0.7			99
Chromium	₹6010B _ 7191 5	200.7218.2	•		SS17
Cobalt	7€6010B	200.7			99
Copper	₹6010B 7211°	200.7220.2			99
lron	₹6010B	200.7		•	99
Lead	₹6010B7421 *	200.7239.2	3113B	4 600	99
Lithium	₹6010B7430 ⁴	200.7		1620	99
Magnesium	₹6010B	200.7			<u>99</u> . 99
Manganese	7 6010B	200.7			99
Mercury	₹7470A³_7471Å				59 99
Molybdenum	₹ 6010B	200.7			 99
Nickel	∑ 6010B	_200.7			99
Potassium	6010B7610 4	200.7258.1 4		1620	99
Rare Earths	6010B ¹	_200.7 '	2442D	1620	<u></u>
Selenium	<u>×</u> 6010B <u>_</u> 7740 °	200.7270.2	3113B	1620	<u></u>
Silicon	∑ 6010B ′	200.7		-1620	99
Silica	6010B	200.7		1020	
Silver	₹6010B7761 °	_200.7 _272.2			
Sodium	₹6010B _7770 ⁴	200.7273.1 4			99
Strontium	∑ 6010B	200.7			
Thallium	₹6010B7841 °		200.9		99 .
Tin	₹ 6010B	200.7			
Titanium	6010B	200.7		1.000	
Uranium	₹6010B'	200.7 '		1620	99
Vanadium	₹6010B	200.7			99
Zine	₹6010B	200.7			9 9
Zirconium	6010B '	200.7 ¹		1620	99
Λ.	<u> </u>	CAIAA			
Other: Hospherous	<u>Metl</u>	nod: 60/0R		1W1	-03 /M-43/01 -00000000000

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

- 1. Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).
- 3. Flame AA.
- 4. Graphite Furnace AA.

L-W1-033/N-04/98

INORGANICS DATA SUMMARY REPORT 05/11/06

CLIENT: TNUKANFORD RC-048 K0277 LVL LOT #: 0603L617

WORK ORDER: 11343-606-001-9999-00

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	建设设置 计中央性 安全的 电电子 中央	美国金属美国国际国际基本企业实际企业企业等等等		=====		*****
-001	J11234	Silver, Total	0.70 u	UG/L	0.70	1.0
		Aluminum, Total	221	UG/L	23.6	1.0
		Arsenic, Total	6.1 u	UG/L	6.1	1.0
		Boron, Total	14.6	UG/L	2.4	1.0
		Barium, Total	4.6	ng\r	0.20	1.0
		Beryllium, Total	0.21	UG/L	0.20	1.0
		Bismuth, Total	5.1 u	UG/L	5.1	1.0
		Calcium, Total	2120	UG/L	21.9	1.0
		Cadmium, Total	0.70 u	UG/L	0.70	1.0
		Cobalt, Total	1.4 u	UG/L	1.4	1.0
		Chromium, Total	1.3 u	UG/L	1.3	1.0
		Copper, Total	1.2 u	UG/L	1.2	1.0
		Iron, Total	31.1	UG/L	5.4	1.0
		Mercury, Total	0.10 u	UG/L	0.10	1.0
		Potassium, Total	771 u	UG/L	771	1.0
		Lithium, Total	0.51	UG/L	0.30	1.0
		Magnesium, Total	89.3	UG/L	39.1	1.0
		Manganese, Total	. 3.2 u	UG/L	3.2	1.0
		Molybdenum, Total	2.9 u	UG/L	2.9	1.0
		Sodium, Total	5140	UG/L	25.1	1.0
		Nickel, Total	2.4 u	UG/L	2.4	1.0
		Phosphorus, Total	9.0 u	UG/L	9.0	1.0
		Lead, Total	3.1 u	UG/L	3.1	1.0
		Antimony, Total	4.4 u	UG/L	4.4	1.0
		Selenium, Total	4.7 u	UG/L	4.7	1.0
		Silicon, Total	9520	UG/L	22.7	1.0
		Tin, Total	17.5	UG/L	10.7	1.0
		Strontium, Total	3.9	DG/L	0.10	1.0
		Thallium, Total	7.0 u	UG/L	7.0	1.0
		Uranium, Total	8.8 u	UG/L	8.8	1.0
		Vanadium, Total	0.90 u	UG/L	0.90	1.0
		Zinc, Total	1.7	UG/L	1.6	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/11/06

CLIENT: TNUHANFORD RC-048 K0277 WORK ORDER: 11343-606-001-9999-00 LVL LOT #: 0603L617

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	result	UNITS	LIMIT	FACTOR
*****	******	****	*****			
BLANK1	06L0195-MB1	Silver, Total	0.70 u	UG/L	0.70	1.0
		Aluminum, Total	23.6 u	UG/L	23.5	1.0
		Arsenic, Total	6.1 u	UG/L	6.1	1.0
		Boron, Total	2.4 u	UG/L	2.4	1.0
		Barium, Total	0.20 ц	UG/L	0.20	1.0
		Beryllium, Total	0.20 u	UG/L	0.20	1.0
		Bismuth, Total	5.1 u	UG/L	5.1	1.0
		Calcium, Total	21.9 u	UG/L	21.9	1.0
		Cadmium, Total	0.70 u	UG/L	0.70	1.0
		Cobalt, Total	1.4 u	UG/L	1.4	1.0
		Chromium, Total	1.3 u	UG/L	1.3	1.0
		Copper, Total	1.5	$n_{\mathbf{G}} \setminus \mathbf{r}$	1.2	1.0
		Iron, Total	5.4 u	UG/L	5.4	1.0
		Potassium, Total	771 u	UG/L	771	1.0
		Lithium, Total	0.30 u	UG/L	0.30	1.0
		Magnesium, Total	39.1 u	UG/L	39.1	1.0
		Manganese, Total	3.2 u	nc/f	3.2	1.0
		Molybdenum, Total	2.9 u	UG/L	2.9	1.0
		sodium, Total	25.1 u	UG/L	25.1	1.0
		Nickel, Total	2.4 u	UG/L	2.4	1.0
		Phosphorus, Total	9.0 u	UG/L	9.0	1,0
		Lead, Total	3.1 u	UG/L	3.1	1.0
		Antimony, Total	4.4 u	UG/L	4.4	1.0
		Selenium, Total	4.7 u	UG/L	4.7	1.0
		Silicon, Total	22.7 u	UG/L	22.7	1.0
		Tin, Total	10.7 u	UG/L	10.7	1.0
		Strontium, Total	0.10 u	UG/L	0.10	1.0
		Thallium, Total	7.0 u	UG/L	7.0	1.0
		Uranium, Total	8.8 u	UG/L	8.8	1.0
		Vanadium, Total	0.90 u	UG/L	0.90	1.0
		Zinc, Total	1.6 u	UG/L	1.6	1.0
BLANK1	06C0057-MB1	Mercury, Total	0.10 u	UG/L	0.10	1.0
BLANK2	06C0057-MB2	Mercury, TCLP Leachate	0.10 u	UG/L	0.10	1.0

INORGANICS LABORATORY CONTROL STANDARDS REPORT 05/11/06

CLIENT: TNUHANFORD RC-048 K0277

LVL LOT #: 0603L617

WORK ORDER: 11343-606-001-9999-00

		•	SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	*RECOV
*				******		
LCS1	06L0195-LC1	Silver, LCS	495	500	UG/L	99.0
		Aluminum, LCS	4930	5000	UG/L	98.5
		Arsenic, LCS	9570	10000	UG/L	95.7
		Boron, LCS	4820	5000	UG/L	96.3
		Barium, LCS	4920	5000	UG/L	98.5
		Beryllium, LCS	249	250	UG/L	99.1
		Bismuth, LCS	4960	5000	ng/p	99.2
		Calcium, LCS	25700	25000	UG/L	102.6
		Cadmium, LCS	241	250	UG/L	96.3
		Cobalt, LCS	2450	2500	UG/L	97.8
		Chromium, LCS	489	500	UG/L	97.8
		Copper, LCS	1240	1250	UG/L	98.9
		Iron, LCS	4970	5000	UG/L	99.4
		Potassium, LCS	23500	25000	UG/L	93.9
		Lithium, LCS	5220	5000	UG/L	104.5
		Magnesium, LCS	24200	25000	UG/L	96.7
		Manganese, LCS	746	750	UG/L	99.4
		Molybdenum, LCS	4980	5000	UG/L	99.5
		Sodium, LCS	23200	25000	UG/L	92.8
		Nickel, LCS	1950	2000	ng/r	97.3
		Phosphorus, LCS	4810	5000	UG/L	96.1
		Lead, LCS	2420	2500	UG/L	97.0
		Antimony, LCS	2950	3000	UG/L	98.4
		Selenium, LCS	9840	10000	UG/L	98.4
		Silicon, LCS	4810	5000	UG/L	96.1
		Tin, LCS	4930	5000	OG/L	98.6
		Strontium, LCS	4990	5000	UG/L	99.8
		Thallium, LCS	9720	10006	UG/L	97.2
		Uranium, LCS	2470	2500	UG/L	98.6
		Vanadium, LCS	2450	2500	UG/L	97.9
		Zinc, LCS	972	1000	UG/L	97.2
LCS1	06C0057-LC1	Mercury, LCS	4.9	5.0	UG/L	98.8

Lionville Labo	ratory	Use Only Custo	dy Trar	1Sf	er l	Rec	ord/l	_ab	Wc	rk	Re	qı	les	t P	age_	<u>\</u> of	1_	-		*	A Rus	V L	127/13
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Washington Closure Hanford	CHAIN OF CUST	ODY/S	AMPLE	ANAL	YSIS	REQUES	T	RC-	048-247	Page 1	of 1
Collector TILLER, B	Company Contact JOAN KESSNER	Telepho 375-4				Project Coord KESSNER, JH		rice Code	7N		rnaround (
Project Designation 100 Area and 300 Area Component of the RCBRA Water Sa	Sampling Location WATER EQUIPMENT BLA	ANK				SAF No. RC-048	A	Air Quality 45			Days
Ice Chest No. AFS-04-035	Field Logbook No. EL-1597		COA BESRAS6	520		Method of Shi FED EX	pment				
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POSSIBLE SAMPLE HAZARDS/REMARKS					Ĭ.						
POTENTIAL RADIOACTIVE < DOT LIMITS	Preservation	HNO3 to pH <2	1	Cool 4C	Cool						
Special Handling and/or Storage	Type of Container	G/P	AG	#132306	∫ ±G		<u> </u>	ļ			
COOL4C	No. of Container(s)	250mL	1000mL	100521	Alon						
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sample analysis		See ison (1) in Special Instructions.	Semi-VOA- 82701 (TCL)	PCBs - 8082	Pessicid 808					:	
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J11234 WATER 03-2	3-06 1530	X	X	X	X						
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FINAL SAMPLE Disposal Method DISPOSITION				Dispos	sed By				ſ	Date/Time	

Lionville Laboratory Incorporated SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: THU	Han	fors
	• • • • • •	

Date: 3 3806

Parchase Order / Project# / R C . D48
(SAF# / SOW# / Release #:

LvLI Batch #:

Sample Custodian:

vLI B	atch#: Non-311017	Samp	le Custodia	" De Miss
•	NOTE: EXP	LAIN ALL DISCI	REPANCIES	7
1.	Samples Hand Delivered or Shipped	Carrier (-c)	£;x	Aibill# 79、8 9827 762
	Custody seals on coolers or shipping container intact, signed and dated?	Ç∕Yes	□ No	☐ No Seals Comments
3.	Outside of coolers or shipping containers are free from damage?	D'Yes	□ No	
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	ØYes	□ No	
. 5.	Samples received of oled or ambient?	Temp 2.0	°C	Cooler # A = 5 - 04 035
6.	Custody seals on sample containers intact, signed and dated?	D'Yes	□ No	□ No Seals
7.	coc signed and dated?	Ø Yes		
8.	Sample containers are intact?	[] ['] Yes	D No	
9.	All samples on coc received? All samples received on coc?	Yes	□ No	
10.	All sample label information matches coc?	D/Yes	□ No	
11.	Samples properly preserved?	D/Yes	□ No	
12.	Samples received within hold times? Short holds taken to wet lab?	U∕Yes	□ No	•
13.	VOA, TOC, TOX free of headspace?	□ Yes	□ N ₀	JANA
14.	QC stickers placed on bottles designated by client?	DY's	□ No	□ N/A
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	D Yes	□ No	
16	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	D Yes	□ No	Discrepancies



Lionville Laboratory, Inc. PEST/PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0277

LVL LOT # DATE RECEIVED: 03/28/06 CLIENT ID LVL # XTM PREP # COLLECTION EXTR/PREP 04/07/06 03/23/06 03/30/06 J11234 001 06LE0248 LAB QC: 03/30/06 04/07/06 MB1 06LE0248 N/A PBLKEM PBLKEM MB1 BS 06LE0248 N/A 03/30/06 04/07/06 N/A 03/30/06 04/07/06 PBLKEM MB1 BSD 06LE0248

Jan 1.76



Case Narrative

Client: TNU-HANFORD RC-048

LVL#: 0603L617

SDG/SAF # K0277/RC-048

W.O. #: 11343-606-001-9999-00

Date Received: 03-28-2006

CHLORINATED PESTICIDES

One (1) water sample was collected on 03-23-2006.

The sample and its associated QC samples were extracted on 03-30-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 04-07-2006. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from a sample that met LvLI's sample acceptance.
- 2. The sample was extracted and analyzed within required holding time.
- 3. The sample and its associated QC samples received a Copper-Sulfur cleanup according to Lionville Laboratory SOPs based on SW846 method 3660A.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. One (1) of eight (8) surrogate recoveries was outside acceptance criteria. However, the surrogate recovery criteria were met (i.e., no more than one outlier per sample).
- 6. All blank spike recoveries were within acceptance criteria.
- 7. Due to insufficient sample volume, matrix QC could not be performed on the sample in this data set. However, the blank spike QC was performed with the sample to demonstrate that systems were in control.
- 8. The initial calibrations associated with this data set were within acceptance criteria.
- 9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



- 10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

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GLOSSARY OF DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution,
- I = Interference.
- Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **pl** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- NS = Not Spiked.
- SP = Indicates Spiked Compound.
- P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- This flag applies to a compound that has been confirmed by GC/MS.
- NPM = No pattern match for multi-component target analytes.

Pesticide/PCBs by GC, CLP List

Report Date: 04/13/06 11:27 Client: TNUHANFORD RC-048 K0277 Work Order: 11343606001 Page: 1 RFW Batch Number: 0603L617

	Cust ID:	J11234	1	PBLKEM		PBLKEM BS		PBLKEM BSD)	
Sample	RFW#:	001	(06LE0248-1	1 B1	06LE0248-1	MB1	06LE0248-M	B 1	
Information	Matrix:	WATER		WATER		WATER		WATER		
•	D.F.:	1.00		1.0	00	1.0	00	1.0	0	
	Units:	UG/L		UG/I	_	UG/1	Ĺ	UG/L	ı	
Surrogate: Tetrach	loro-m-xylene	42	ક	95	ક	77	왕	84	*	
	hlorobiphenyl	15 * 9		92	*	83	8	88	४	
######################################				0.050	=fl U	======= 92	==fl %	106	=fl===== %	=====fl=====
gamma-BHC (Lindane)_		0.33		0.050	IJ	93	ş.	106	8	
Beta-BHC		0.33		0.050	Ū	85	₽	97	*	
Heptachlor				0.050	U	83	ş	88	*	
Delta-BHC		0.33		0.050	Ū	86	*	100	*	
Aldrin		0.33		0.050	Ū	86	*	91	r F	
Meptachlor epoxide		0.33	U	0.050	Ū	92	કૃ	106	*	
gamma-Chlordane		0.33	U	0.050	U	91	ક	104	- %	
Indosulfan I		0.33 (U	0.050	U	92	¥	107	*	
alpha-Chlordane		0.33 t	Ū	0.050	Ū	91	*	105	*	
,4'-DDE		0.33 (U	0.050	U	91	ક્ર	105	¥	
Dieldrin		0.33	U	0.050	U	95	ક્ર	112	*	
Endrin		0.33 (U	0.050	U	94	8	111	*	
4'-DDD		0.33 t		0.050	U	89	*	102	*	
Endosulfan II		0.33 t	U	0.050	U	93	ક	108	8	
1,4'-DDT		0.33 t	_	0.050	Ū	94	ક્ષ	111	*	
Endrin aldehyde		0.33 t		0.050	U	84	ફ	97	*	
Endosulfan sulfate	<u>.</u>	0.33 t			Ü	88	옿	103	*	
Methoxychlor		0.33 t	-	0.050	U	91	ક્ર	104	*	
Endrin ketone		0.33 t	U	0.050	U	93	ક	107	*	
Toxaphene		3.3 t	U	0.50	U	0.50	U	0.50	U	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Porpole

Lionville Labo	ratory	Use Only	Custo	dy Tra	ans	sfe	er l	Rec	ord/l	Lab	W	ork	Re	equ	ıes	t P	age_	<u> </u>	f <u> </u>	_		7	Y[<u>VL</u>	
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			TAT 3					Preserv	alives	100						37.	4,190	HNO			- 1				
			Date Due					ANALYS REQUE			VO A	1	SANIC B ES	Herb	Pest	5/8		Metal (ORG E						
- 40.8 Juli	1			JF 3/22/3/2						<u> </u>			1		1,41,141	تستط	ville L	borate	ry Use	Only		1	1	1	
MATRIX CODES: S - Soll SE - Sediment SO - Solid SL - Studge	Lab ID		Client ID/Descrip	otion		Mat Q(Cho: (-/	C sen 3	Matrix	Date Collected	Time Collected			OPLB		HESTO	45000		METRE							
W - Water O - Oil A - Air	42:	7119	1 34L 2 2 2			MS /	MSD	WO Ex	3 2306	15 an	9/40		X		×	X		X				<u> </u>			
DS - Drum Solids	COT	3112					3		7.230		179								1410					•	-
DL - Drum Liquids		, a													27 gg						1, 1, 1 1, 1, 1			754	
L - EP/TCLP Leachale								1111			1														
Wt - Wipe X - Other				计数性能												2.									
F - Fish		2.3				2		4.7	1333	15 July 2009	1	(a)			7.47	2.7	27.22		144.		13. A.				
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COLAR COLER No. AFS - OF - OS - OF - OS - OS - OS - OS -	Collector TILLER, B									,			•	ator	Price	Code	7N		17
Ottolic Property No. Problems SERVICES (LONVILLE)	Project Designation 100 Area and 300 A	Area Compone	nt of the RCBRA V	Vater Sa			NK								Air (Quality		45 1	Jays &
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POTENTIAL RADIOACTIVE < DOT LIMITS Preservation Preservation	Shipped To EBERLINE SERVI	ICES (LION)	TLLE		Offsite	Property No. AO	603	42	3			F	_	Air Bill N	Ĭo.			· · · · · · · · · · · · · · · · · · ·	
Special Handling and/or Storage COOL 4C Type of Container() No. of Container() Volume 25ml Volume Volume Volume Volume Volume Volume Volume Volume Volume V	POSSIBLE SAMPL	E HAZARD	STREMARKS		l		<u> </u>				Ĭ				ľ				İ
No. as Container(s) Volume 250nd. 100nd. 1	POTENTIAL RADIO	ACTIVE < D	OT LIMITS			Preservation	<2	1			1	_							
Sample No. Marix * Sample Date Sample Time Sign/Print Names CHAN OF POSSESSION Sign/Print Names Sign/Print Names Sample Date Sign/Print Names Sign/Pri	Special Handling	and/or Stora	age			Type of Container	G/P	1		#132306					_				
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Lionville Laboratory Incorporated SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: THU Harrford

Date: 3.380C

Sample Custodian:

Parchase Order / Project# / RC . 048 SAF# / SOW# / Release #:

LvLI Batch#:

NOTE: EXPLAIN ALL DISCREPANCIES 18 9827 Carrier H-co Ex Samples Hand Delivered or Ships Comments No Seals Custody seals on coolers or shipping □ No container intact, signed and dated? Outside of coolers or shipping containers are □ No free from damage? 4. All expected paperwork received (coc and □ No other client specific information) sealed in plastic bag and easily accessible? Cooler # A FS - 04 035 Temp 2.0 5. Samples received of oled or ambient? IR. Custody seals on sample containers intact, □ No ☐ No Seals signed and dated? coc signed and dated? □ No Sample containers are intact? ☐ Yes □ No All samples on coc received? All samples D No received on coc? 10. All sample label information matches coc? D No 11. Samples properly preserved? □ No 12. Samples received within hold times? Ç∕Yes Short holds taken to wet lab? 13. VOA, TOC, TOX free of headspace? ☐ Yes □ No DINA G/Yes 14. QC stickers placed on bottles designated by □ No DNA client? 15. Shipment meets LvLI Sample Acceptance Q∕Y¤ □ No Policy? (Identify all bottles not within policy. See reverse side for policy) 16. Project Manager contacted concerning 🛛 Yes □ No ĽNo discrepancies? name/date (or samples Discrepancies outside criteria)



Lionville Laboratory, Inc. PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD RC-048 K0277

N/A

N/A

N/A

03/30/06

03/30/06

03/30/06

DATE RECEIVED:	03/28/06			1	LVL LOT # :	0603L617
CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J11234	001	W	06LE0248	03/23/06	03/30/06	04/06/06
LAB QC:						

W 06LE0248

W 06LE0248

W 06LE0248

MB1

MB1 BS

MB1 BSD

PBLKEM

PBLKEM

PBLKEM

Ampole

04/06/06

04/06/06

04/06/06



Case Narrative

Client: TNU-HANFORD RC-048

LVL#: 0603L617

SDG/SAF # K0277/RC-048

W.O. #: 11343-606-001-9999-00

Date Received: 03-28-2006

PCB

One (1) water sample was collected on 03-23-2006.

The sample and its associated QC samples were extracted on 03-30-2006 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 04-06-2006. The extraction procedure was based on method 3520C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from a sample that met LvLI's sample acceptance policy.
- 2. The sample was extracted and analyzed within required holding time.
- 3. The sample and its associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. One (1) of eight (8) surrogate recoveries were outside acceptance criteria. However, the surrogate recovery acceptance criteria were met (i.e. no more than one outlier per sample).
- 6. All blank spike recoveries were within acceptance criteria.
- 7. Matrix spike QC was not performed on any samples in this data set. However, blank spike QC was performed with these samples to demonstrate that systems were in control.
- 8. The initial calibrations associated with this data set were within acceptance criteria.
- 9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

- 10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
- 11. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

kim\r:\group\data\pest\tnu hauford\0603-617.pcbs

TIONNILL LABORATORY INC.

1/18/06

Date



GLOSSARY OF DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.
- . I = Indicates an interference on one analytical column only. Result is reported from remaining analytical column.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- BSD = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- DL = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- NS = Not Spiked.
- SP = Indicates Spiked Compound.
- P = This flag is used for an PESTICIDE/PCB target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- D = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.
- NPM = No pattern match for multi-component target analytes.

LIONVILLE LABORATORY, INC.

PCBs by GC

Report Date: 04/08/06 11:14 Client: TNUHANFORD RC-048 K0277 Work Order: 11343606001 Page: 1 RFW Batch Number: 0603L617

	Cust ID:	J11234	ł	PBLKKM		PBLKEM BS		PBLKEM BSD		
Sample Information	RFW#: Matrix: D.F.: Units:	001 WATER 1.0 UG/I	0	06LE0248-M WATER 1.0 UG/L	0	06LE0248-M WATER 1.0 UG/L	0	06LE0248-M WATER 1.0 UG/L	0	
Surrogate:	Tetrachloro-m-xylene	43	*	99	*	92	*	97	¥	
	Decachlorobiphenyl	20 4	*	106	*	110	¥	113	ŧ	
==============			=f1	========	=£1		=f1	222222222	=f1	. ========== ==========================
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Aroclor-1221	-	2.7	Ų	0.40	U	0.40	U	0.40	U	
Aroclor-1232		2.7	U	0.40	U	0.40	U	0.40	U	
Aroclor-1242		2.7	U	0.40	Ü	0.40	U	0.40	U	
Aroclor-1248		2.7	U	0.40	U	0.40	U	0.40	บ	
Aroclor-1254		2.7	Ū	0.40	U	0.40	U	0.40	U	
Aroclor-1260		2.7	U	0.40	U	105	*	115	Ł	

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Labo	ratory	Use Only	Custo	dy T	ran	sf	er i	Rec	ord/l	Lab	W	ork	Re	qı	ıes	t P	age_	<u>'</u> 0	f <u> </u>	_		1	UL	YL	
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Lionville Laboratory Incorporated SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: THU Harrford

Date: 3 38 0し

Porchase Order / Project# / RC . 048
SAF# / SOW# / Release #:

LyLI Batch #:

Sample Custodian:

vLI B	atch#: 0(003L1017	Samp	le Custod	ian: al Arian
	NOTE: EXP	LAIN ALL DISCI	REPANCIE	3
1.	Samples Hand Delivered or Shipped	Carrier -cù	۶.*	SUF 7588 819F #IIIdilA
2.	Custody seals on coolers or shipping container intact, signed and dated?	□ Yes	□ No	□ No Seals Comments
3.	Outside of coolers or shipping containers are free from damage?	D'Yes	□ No	
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	p Yes	□ 1 %	. •
5.	Samples received pooled or ambient?	Temp 2.0	°C	Cooler # A FS - OA 035
6.	Custody seals on sample containers intact, signed and dated?	₽ [†] Yes	□ No	🖸 No Seals
7.	coc signed and dated?	Ç i Yes	□ No	
8.	Sample containers are intact?	D/Yes	□ No	
9.	All samples on coc received? All samples received on coc?	O'Yes	□ N•	·
10.	All sample label information matches coc?	D/Yes	□ No	
11.	Samples properly preserved?	17 Yes	O No	
12.	Samples received within hold times? Short holds taken to wet lab?	D/Yes	□ No	
13	. VOA, TOC, TOX free of headspace?	. DYcs	□ No	PANA
14	. QC stickers placed on bottles designated by client?	D'Yes	□ No	□ N/A
15	. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	9 ⁴ 4es	□ №	· · · ·
16	 Project Manager contacted concerning discrepancies? name/date (or samples outside criteria) 	O Yes	□ Na	Discrepancies